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ABSTRACT

The role played by written tests in Swedish schools was studied through a survey of 1,817 eighth-grade teachers (the senior level of compulsory school in Sweden) and 589 teachers of the second year of upper secondary school in three counties in Sweden (the response rate was 75%). The survey was supplemented with 51 interviews of teachers at four schools. Topics addressed in the survey include: (1) teachers' reasons for using written tests; (2) occurrence of tests; (3) parameters that are measured by the tests (knowledge, application, comprehension, production, or a combination of these parameters); (4) ways that tests are processed and analyzed; and (5) how test results are applied to school work. For the week specified in the survey (week 43 of 1987), 958 written tests were reported: 721 at the senior level of compulsory school, and 237 at the upper secondary school level. Students were administered about two tests a week, and these played an important part in awarding grades. It was difficult to gain any picture of the analysis or processing of tests. Use of the tests as an educational resource was seldom mentioned, although tests were reported to be used frequently for practice and revision purposes. Overall, tests were mainly used in determining grades. Two tables and three figures present study data. A 25-item list of references is included. (SLD)

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SCHOOL RESEARCH NEWSLETTER

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Title of project: TESTS IN SCHOOL

Tests in school are part of the examination process and affect both pupils' way of studying and their marks. Written tests and other assessments of pupils' achievement ought therefore to be an integral part of teaching. This report deals with the role played by written tests in Swedish schools today.

The study illuminates:
- Teacher's reasons for setting written tests
- The occurence of tests
- What the tests measure (e.g. knowledge, applications, understanding, free production etc.)
- How tests and test results are processed and analysed in school
- How test results are fed back into school work

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Umeå University, 1989

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1989:7 Bilingualism in school
1989:8 Women´s perspective on popular education
1989:10 Swedish upper secondary school english
1989:11 Essay writing. Writing instruction. Youth education

BACKGROUND

When, after nearly eight years' compulsory schooling, pupils enter the senior level grades, their first marks are imminent. Marks and the assessments and achievement checks occurring in school have often been the subject of lively and vehement debate. The arguments used may sometimes be rooted in facts and known research findings, but no less often they are taken from isolated events or from second-hand statements, some more well-founded than others. This has sometimes resulted in completely contradictory images of Swedish schools, such as: "...teaching is dominated by examinitis..." and "...there is no real verification of achievement in schools today...". Dependable basic information on the way in which written tests are used at senior level (compulsory school) and in upper secondary school has been lacking. This has made it difficult to assess properly the accuracy of individual statements or, for one's own part, to offer constructive criticism of the work of schools in this respect.

Examination, i.e. the assessment and valuation of pupils' assessment of the instruction received, is part of the teaching process and must therefore reflect the intentions of the curricula and the teachers. Tests are only part of the examination process in school, but a succession of surveys have made clear that they make a big difference to the pupils' way of studying and to what they learn. Various types of test and their conceivable roles in different contexts are discussed in the Upper Secondary School Curriculum (Lgy70). In the Compulsory School Curriculum (Lgr80), on the other hand, written tests are mentioned only in passing. Although written tests and other assessments, as stated above, ought to be an integral part of teaching, hardly any follow-up has been undertaken, since the above mentioned curricula were adopted, to make sure that they really are.

This study, funded by the NBE, was prompted by a perceived shortage of documentation and generalised knowledge concerning the role played by written tests in Swedish schools today.

The main purpose of the study was to <u>chart and describe</u>:

- Teachers' reasons for setting written tests.
- The occurrence of tests.

- What the tests measure (e.g. knowledge, applications, understanding, free production etc.).
- How tests and test results are processed and analysed in school.
- How test results are fed back into school work.

To achieve this main purpose, the procedures employed for data collection and processing had to be made as appropriate and dependable as possible. **The secondary purpose of the study**, therefore, was, insofar as there were any points of methodological uncertainty, to check these as far as possible or to look for alternative methods. In this way the dependability of both working methods and results obtained could be tested and appraised.

THE SURVEY

The main study was preceded by two pilot studies, experience from which did a certain amount to govern the design of questionnaires and the choice of working procedures. The main study in turn was divided into two different parts. A short questionnaire was addressed to all teachers in three counties who, during a specified week, taught grade 8 in compulsory school or grade 2 in the 3- or 4-year lines (study programmes) of upper secondary school. This was supplemented by an intensive study of teachers at four of the schools taking part in the questionnaire study. They were interviewed twice, to verify the results of the questionnaire and also for a thorough discussion of questions which could not be included in the questionnaire, as well as for detailed processing of some of their own tests.

In the questionnaire the teachers were asked which subjects they taught and what use they made of tests in their teaching. In addition, each teacher was required to list the written tests given in the two grades during the week in question. The tests were to be described in various ways. Firstly, a number of general facts were stated, such as subject, length of test, test designer and so on, and then the tests had to be classified according to certain characteristics. The categories in these cases were described directly in the questionnaire form. The characteristic found most difficult to classify was TYPE OF TEST, referring to the dominant cognitive properties of the test as stated below.

Type of test

Tests consisting mainly of questions designed to measure the straight learning of facts are to be looked on as knowledge tests, those consisting mainly of questions to measure understanding are called comprehension tests, and so on. If in your opinion a test contains roughly equal proportions from two fields, then for example you can put both K/T. The tests are classified as indicated below.

K = KNOWLEDGE, i.e. reproduction of learned facts, arguments, principles etc.

T = APPLICATION, i.e. problem-solving or practical exercises in which knowledge, practised solution strategies, rules of grammar etc. are applied.

F = COMPREHENSION, i.e. questions testing understanding of concepts, principles, arguments etc. (N.B. Not reproduction of arguments presented earlier.)

P = PRODUCTION, i.e. mainly comprising summaries, essays etc. where the pupils have to supply "their own" content or disposition.

?/?= COMBINATION (roughly half each) of two of the above types of question, e.g. K/T.

According to the intensive study, however, there was good agreement as regards interpretation of the meaning of the different designations.

The questionnaires were distributed in the Counties of Kristianstad, Västernorrland and Västerbotten. Altogether these counties had 109 senior-level compulsory schools and 26 upper secondary schools with the relevant lines of study. About 75% of the questionnaires distributed were completed and returned without a reminder being necessary. The results presented are based on 1,817 questionnaires from grade 8 (compulsory school, senior level) and 589 from grade 2 of upper secondary school.

The intensive study was conducted by means of interviews on two different occasions, one fairly soon after the questionnaire study and the other three months later, when the questionnaire material had been partly coded

and processed. Visits were paid to two senior level schools and two upper secondary schools. On the first occasion a total of 33 teachers took part. The second interview, which took longer, involved 18 of the teachers - nine from each type of school.

The analyses performed of participation and non-response suggest that the teachers taking part are representative both locally, of their school levels, and of the country as a whole.

A lot of the encoding was done by the teachers themselves when completing the questionnaire forms, by classifying their tests with reference to given categories. Dependability in this respect could be rated good as regards inter-teacher agreement. The same goes for the two assessors who subsequently processed the open-ended question in the questionnaire.

SOME FINDINGS

For the specified week (week 43, 1987) a total of 958 written tests were reported, viz 721 at the senior level of compulsory school and 237 in upper secondary school.

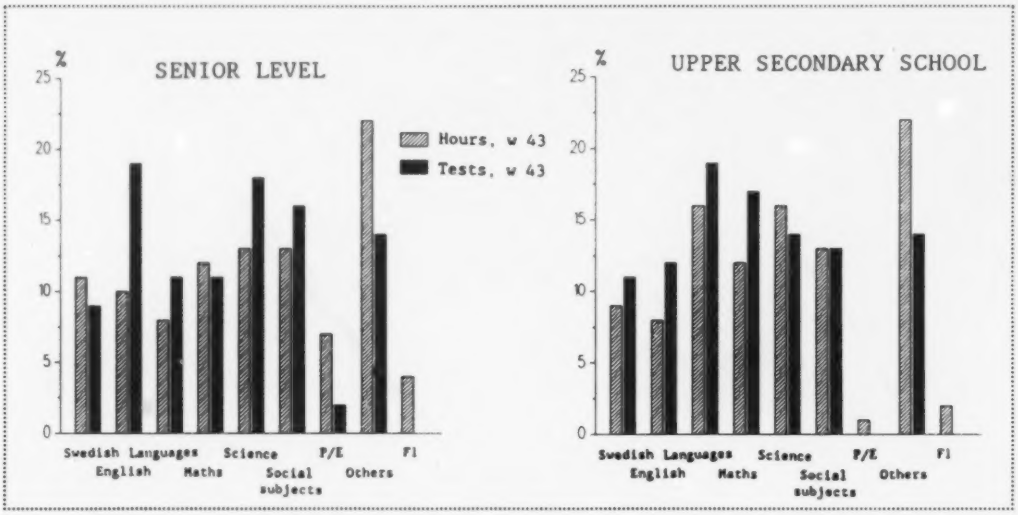

Figure 1. Distribution of lessons and tests between the different groups of subjects.

The structure of the study made it possible to compare the frequency of tests during the reference week between different groups of school subjects. Comparison with the number of teachers for the different subject groups showed that teachers of certain subjects set more tests than others. At the senior level of compulsory school this applied mainly to English, science subjects and social subjects. In upper secondary school it was teachers of English and mathematics who, relatively speaking, set more written tests than others. On the whole this tendency persisted when a comparison was made with the total number of lessons in each subject, as can be seen from the figure above.

It was less easy to judge how many tests were taken on average by the pupils during the week reported, but a relatively good estimate could be arrived at by relating the reported tests to the total number of lessons during the week and to the pupils' normal time schedules. According to these calculations the senior level pupils, on average, had upwards of two tests during the week, and the upper secondary school students had rather less than two.

But the amount of teaching scope pre-empted by tests could also be elucidated by making comparisons with the duration of the tests. From the pupils' viewpoint, this yielded a slightly different "test load", because very often a smaller number of tests was offset by longer duration. Subject-wise this applied to mathematics, which invariably had longer average test times than other subject groups. Really short tests were commonest in the various language subjects. If similar comparisons are made between senior level and upper secondary school, the effect becomes even more striking, as can be seen from Figure 2.

On average, the tests taken by the upper secondary school students were nearly twice as long, in terms of maximum permissible duration.

Roughly half the tests in upper secondary school were common to several classes. Common tests occur less frequently at the senior level of compulsory school, but almost one-third of the tests reported there were common to several classes.

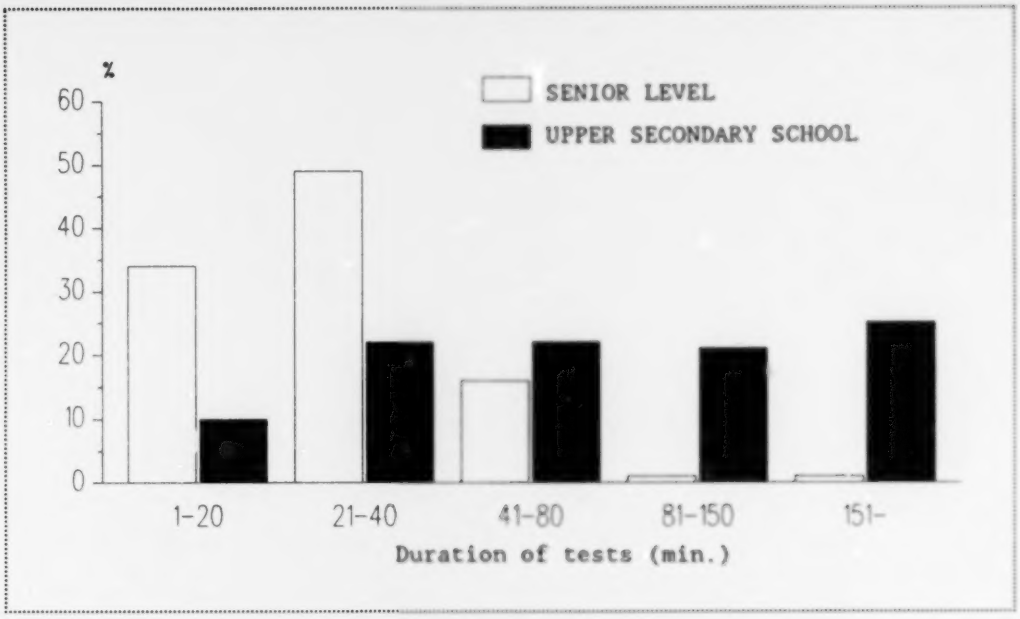

Figure 2. Duration of tests in minutes, senior level and upper secondary school.

Published tests were seldom used, at least in their entirecy. There were cases of individual questions from collections of tests or from other teaching materials being mingled with questions constructed by the teachers themselves. Seventy-three per cent of the senior level teachers stated that the tests reported were their own material. The corresponding figure for the upper secondary school teachers was 55%. Tests in collaboration with other teachers were more common in upper secondary school, which is natural in view of the more frequent use there of tests common to several classes.

The teachers were asked to specify the type of written test given during the week, with reference to the description in terms of **Knowledge**, **Application**, **Comprehension** and **Production** supplied in the questionnaire form (see page 3).

In 45 and 60%, respectively, of all cases, content was classified as some form of combination. The tests referred exclusively to one category are separately presented. The combination answers are presented in full, but they have also been broken down in to the various categories included in each combination and added to the single-category tests. The results are presented in parentheses in the Table, under the heading (TOT).

Table 1. Teachers' description of the tests by type (holistic assessment, as per predefined categories, of the tests given in week 43).

TYPE OF TEST	SENIOR LEVEL		(TOT)	UPP. SEC. SCHOOL		(TOT)
KNOWLEDGE TESTS	291	42%	(81%)	41	18%	(68%)
APPLIED TESTS	51	7%	(42%)	40	18%	(63%)
COMPREHENSION TESTS	23	3%	(27%)	4	2%	(43%)
PRODUCTION TESTS	23	3%	(6%)	7	3%	(9%)
COMBINATION TESTS	313	45%		136	60%	
No. replies	701			228		

Table 1 shows that knowledge questions bulk larger at senior level than in upper secondary school and that the element of applied and comprehension questions increases considerably as we move up the age scale.

Tests in which most of the questions belong to a single category appear, judging by the teachers' own descriptions, to be less frequent. The exception, if any, concerns the senior level of compulsory school, where several tests were given for the primary purpose of measuring knowledge. In the case of upper secondary school, knowledge questions, as defined for our purposes, do not play an important part in one-third of the tests. Questions of this kind predominate in less than one-fifth of upper secondary school tests. This is not to say that knowledge is not measured in the majority of tests, because both applied, comprehension and production tests, as defined above and according to the teachers' own remarks, require certain kinds of knowledge on the pupil's part.

Comparing the six main, specified subject groups, one finds that patterns vary from one group to another. The "straight" knowledge tests at the senior level of compulsory school are above all referable to general subjects (54% for tests in science subjects, 65% for tests in social subjects). Distinct elements of knowledge testing, however, are reported for nearly all tests in social subjects (95% at senior level and 100% in upper secondary school). The applied element is most prominent in "English", "languages" and "mathematics". English at the senior level of compulsory school deviates somewhat from this pattern by giving considerable scope to knowledge elements. In upper secondary school, the applied element also bulks large in science tests. In all subjects, tests are readily referred to more than one category, and especially in upper secondary school, where more than half of all the tests given are referred to two categories or more.

The questionnaire included an open-ended question which read as follows:

"State briefly how you use tests in your teaching, taking the school year as a whole."

The general wording of this question gave the teachers an opportunity of broaching the aspects which each of them considered most central. Some of them discussed the various uses of tests, others described how often they set written tests on homework and others again described how they planned the main tests of the year. Many replies were very exhaustive, and the great majority had stated viewpoints which can provide a direct basis for comparisons with "cross-sectional results" from the survey week.

Since the teachers had a free choice of topic, the answers cannot be presented as if they were typical of the profession as a whole. Instead the answers to a particular sub-question have to be related to the group which felt that this particular aspect of test management was an important one to talk about. It is, however, reasonable to conclude that a question spontaneously raised by many respondents in reply to a completely open-ended question must be considered important for the activities and to the people working on them.

The answers are presented as statements, which means that a single teacher may have volunteered several, substantially different statements about one and the same phenomenon. Every such statement is presented as a separate answer.

In their descriptions, more than half the teachers stated various possible reasons for using written tests. At the senior level of compulsory school, 923 of the 1,817 teachers volunteered a total of 1,622 statements about the purposes of tests, the corresponding figures for upper secondary school being 537 statements from 319 of the 589 teachers.

The purposes have been grouped into nine different categories, as shown in Figure 3.

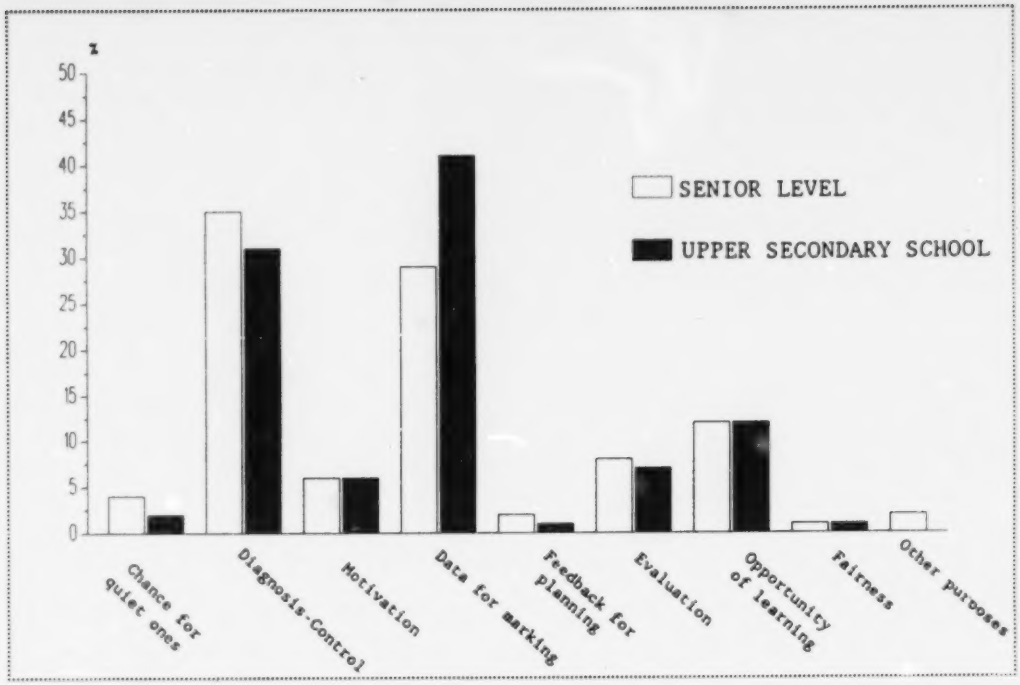

Figure 3. Purposes of written tests, as stated by senior level and upper secondary school teachers.

A general check on pupils, without specifying any further measures, is one of the two purposes most often stated. The teachers' spontaneous replies did not make it possible to distinguish general statements about checking up on the pupils from general descriptions of diagnostic purposes. Terminological usage was very mixed. The term "**diagnosis**" sometimes meant checking up, in a very general way, on what the pupils had learned. In other situations it meant that a test had been used which had the words "diagnostic test" on it, while other descriptions again made it clear that the test had not been used to check up on the pupils but as an active ingredient in teaching. Similarly, the general statements about "**control**" proved capable of representing the same situations. Discussion of the role of tests in teaching would of course have benefited a great deal if there had been a clear distinction between "diagnosis" and "control". In the above diagram, this mixed category covers quite a wide variety of purposes, which also helps to account for the large number of statements.

Obviously the written tests are looked on as an important source of data for marking, even though many teachers were at pains to point out that tests are only one of several kinds of input data.

Where most of our categories are concerned, the same picture emerges for both types of school. Categories 2 and 4 are the exceptions to this rule. Tests are more often referred to by upper secondary school teachers as a basis for the award of marks, while senior level teachers more often profess to use the results of tests for diagnosis or control.

The questions in the questionnaire were also discussed in depth during the interviews in the intensive study. In addition, during visits to schools, a number of tests were reviewed in collaboration with the teachers concerned. Certain new questions were also considered.

The teachers consulted were asked to place four types of input data for the award of marks in ranking order, viz oral tests, written tests, reports and continuous observations.

The valuations arrived at by the two groups taking part can be roughly described by calculating the average ranking value for each type of input data. The type of input data for marking most important to the individual teacher has been given the ranking number 1, while the least important has been ranked as number 4. In cases where the teacher was unable to distinguish between two types, both were given the same ranking number.

The written tests, as can be seen from Table 2, were ascribed most importance for marking by the upper secondary school teachers, which further reinforces the impression of the main function of tests in upper secondary school being to provide input data for marking. Tests, reports and continuous observations carried roughly equal weight with the senior level teachers. "Oral tests" were ascribed least importance at senior level, "reports" in upper secondary school.

Table 2. Ratings of the potential importance of different types of input data for the award of marks, expressed as average ranking scores.

Basis of assessment	Senior level	Upper secondary school
Written tests	2.2	1.2
Reports	2.3	3.6
Oral tests	3.3	2.4
Continuous observations	1.8	2.6

The main impression seems to be that the different bases of assessment are considered mutually complementary. At the same time, several of the teachers interviewed point out that the pupils do not always believe this, even when told by the teachers that assessments are arrived at in this way. It was said to be quite common for pupils to believe that marks were decided almost exclusively by tests, and this indeed is not contradicted by the outcome, since the different bases of assessment often yield the same results.

Processing of the tests called in showed that it is perfectly possible in various ways to obtain a more detailed picture of written tests than was accomplished in the questionnaire study, by judging each question separately and adding up numbers or points for each category. This method, however, is very time-consuming and requires the assistance of the teacher taking the class.

REMARKS

The descriptions in this study have been deliberately based on the teachers' viewpoints. The sub-questions to be elucidated were of varying character and it is hard to imagine any other individual group in the school community capable of supplying well-informed viewpoints on all the questions which had to be answered.

The survey showed that the pupils come up against roughly two tests a week. Given the construction of the study, we may presume that this figure can hardly be an underestimate. The survey period had been chosen so that the results would not reflect an extreme situation in any way. But experience from other studies and a number of statements in the course of interviews have shown that "seasonal variations" can be very considerable. So perhaps an average does not accurately mirror the pupils' experience of the test situation. Perhaps it is the "test peaks" and the use of tests which are found irksome, rather than the total number of tests occurring during the school year.

It has often been alleged in the course of public debate that school tests, for the most part, deal exclusively with knowledge of facts out of context, and that in the long term this can impede the pupils' contextual

understanding and impair their interest in reading with understanding. The present study, however, yields a more balanced picture. The cognitive descriptions obtained in the questionnaire study were the teachers' own classifications, on the basis of the definition supplied. The "cognitive" teaching objectives, however, have formed the subject of a fair amount of discussion over the years. Both Lgy70 and Lgr80 stress, at several points, that teaching must not concentrate exclusively on the memorisation of facts. This is a message with which most people are acquainted and which few are likely to have any objection to. It is hard to tell how greatly this realisation can have influenced teachers' assessments of their own tests. Judging from our observations above, the teachers' image seems to be rather euphemistic compared with the experience gained by reviewing randomly collected tests, e.g. in the pilot studies.

There is no doubt that tests play an important part in the award of marks. Their importance in this respect has hardly been exaggerated in the classifications in the different studies, because some of the other purposes referred to can also allude indirectly to the award of marks, e.g. "chance for the quiet ones", "fair" and "control". The marking function, however, had fewer advocates among the teachers in the senior level study than among the senior level teachers in the questionnaire survey. Instead, tests as a motivation factor and a spur to the pupils carried a good deal more weight in the senior level study.

It was impossible to obtain an exhaustive answer to the question of **how the tests and test results are processed and analysed in school**. Hardly any mention was made of any form of analysis of test results. The post-facto reviews reported were often confined to systematic storage for the benefit of colleagues or a check to see whether a question ought to be deleted before the pupils were given their results.

How are test results used in school work? Both the questionnaire study and the intensive study show that the 2,400 or so teachers taking part were definitely interested in the use made of tests and test results. Very few indeed, however, pointed to the possibility of using their own tests and the test results of their classes as an educational resource. In certain cases, the procedure for handling tests appears to be stereo-type, indeed run-of-the-mill. In a couple of instances teachers taking part in the interview study referred to variants and interesting angles on what could be derived from the test results. But at the same time, one of

these teachers almost apologised for departing from the traditional way of doing things. That test included, for example, a question for which no marks were obtainable, its sole purpose being to probe the pupils' thinking habits. (There was no "right" answer to the question.)

Teaching arguments, indeed, were very sparingly used by the teachers when describing their test activities. Mention was sometimes made of tests for purposes of practice or revision, and in some cases of tests as a way of getting the pupils to work.

Finally we should mention that this study focused exclusively on the 3- and 4-year lines of upper secondary school, but that it would also be very interesting indeed to chart the use of tests in the vocational lines. For one thing, test conditions are different in the case of subjects which are not emphatically theoretical, and secondly revised syllabi, increasing the duration of studies to three years and introducing a new system of marking for certain subjects, will create new problems of assessment. There ought, therefore, to be every reason for gathering experience of achievement testing and the use of tests in these study programmes.

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